

CLAIMS

1. Circuitry for generating a sequence of probable symbols from a
2 sequence of received symbols using Reduced State Sequence Estimation,
comprising:
4 butterfly circuitry for computing terms in butterfly structure of
 $sm_1' = \min\{sm_1 + m, sm_2 - m\}$ and $sm_2' = \min\{sm_1 - m, sm_2 + m\}$; and
6 circuitry for computing multiple path metrics between a first state and a
second state responsive to the received symbols and reference constellation
8 symbols and determining a best scenario at the second state using said butterfly
circuitry.
2. The circuitry of claim 1 and further comprising circuitry for
2 rotating said received symbols by a predetermined angle.
3. The circuitry of claim 1 and further comprising circuitry for
2 rotating said reference constellation symbols by a predetermined angle.
4. The circuitry of claims 2 and 3 wherein said predetermined angle is
2 $(2k+1)*\pi/8$ with k being an whole number.
5. The circuitry of claim 1 and wherein said reference constellation is
2 an 8-PSK constellation, circuitry for expressing axis symbols of the constellation
as a function of diagonal symbols in order to assure symmetrical properties for
4 use of the butterfly circuitry.
6. A method of generating a sequence of probable symbols from a
2 sequence of received symbols using Reduced State Sequence Estimation,
comprising the steps of:
4 computing multiple path metrics between a first state and a second state
responsive to said sequence of received symbols using a butterfly structure of
6 $sm_1' = \min\{sm_1 + m, sm_2 - m\}$ and $sm_2' = \min\{sm_1 - m, sm_2 + m\}$; and

determining a best scenario at the second state using said butterfly
8 structure.

7. The method of claim 6 and further comprising the step of rotating
2 said received symbols by a predetermined angle.

8. The method of claim 6 and further comprising the step of rotating
2 said reference constellation symbols by a predetermined angle.

9. The method of claims 7 and 8 wherein said predetermined angle is
2 $(2k+1)*\pi/8$ with k being a whole number.

10. The method of claim 6 wherein the reference constellation is an 8-
2 PSK constellation, and further comprising the step of expressing axis symbols of
the constellation as a function of diagonal symbols in order to assure
4 symmetrical properties for use of the butterfly circuitry.